

10/584342

44 1AP20 Rec'd PCT/PTO 23 JUN 2006

CLAIMS

1. (Amended) A fuel cell disassembly method of disassembling a fuel cell, the fuel cell comprising: an
5 electrode assembly having an electrolyte interposed between a pair of electrodes; sealing layers located to surround periphery of the electrode assembly; and a pair of separators arranged across the electrode assembly and bonded to the
10 electrodes has a fuel gas conduit, while the other of the separators facing the other of the electrodes has an oxidizing gas conduit,

said fuel cell disassembly method comprising the step of:

15 supplying a specific fluid (which is referred to as a fluid supply for disassembly of the fuel cell) to at least one of the oxidizing gas conduit and the fuel gas conduit to facilitate separation of the electrode assembly from the pair of separators, where the specific fluid is supplied to heighten
20 an in-passage pressure of at least one of the oxidizing gas conduit and the fuel gas conduit over a level of in-passage pressure level during power generation by the fuel cell or otherwise the specific fluid has a function of lowering an adhesive force of the sealing layers.

25 2. (Amended) A fuel cell disassembly method in accordance with claim 1, wherein the specific fluid having the function

of lowering the adhesive force of the sealing layers is different from a fluid supplied for power generation of the fuel cell.

3. (Amended) A fuel cell disassembly method in accordance
5 with claim 1, wherein the fluid supply for disassembly of the fuel cell is carried out to supply a fluid to both of the fuel gas conduit and the oxidizing gas conduit.

4. (Canceled)

5. A fuel cell disassembly method in accordance with
10 claim 1, wherein the separator is kept pressing or surrounded during the fluid supply for disassembly of the fuel cell.

6-7 (Canceled)

8. (Amended) A fuel cell disassembly method in accordance
with claim 1, wherein the specific fluid having the function
15 of lowering the adhesive force of the sealing layers is either water or an organic solvent, which is different from a fluid supplied for power generation of the fuel cell.

9. (Amended) A fuel cell disassembly method in accordance
with claim 1, wherein the specific fluid having the function
20 of lowering the adhesive force of the sealing layers has a higher temperature than a temperature of a fluid supplied for power generation of the fuel cell

10. A fuel cell disassembly method in accordance with
claim 1, wherein an external force is additionally applied in
25 directions of parting the pair of separators from each other during the fluid supply for disassembly of the fuel cell.

11. A fuel cell disassembly method in accordance with claim 1, said fuel cell disassembly method further comprising the step of:

weakening a pressing force applied in a direction of
5 making the pair of separators approach to each other during power generation of the fuel cell, prior to said step of providing the fluid supply for disassembly of the fuel cell.

12. A fuel cell disassembly method in accordance with claim 1, wherein said fluid supplying step supplies the
10 specific fluid to facilitate separation of the electrode assembly from the pair of separators included in either a fuel cell stack or a fuel cell module, which is a layered body of plurality of the fuel cells.

13. (Amended) A fuel cell disassembly method that
15 disassembles a layered body of multiple fuel cells having a coolant sealing layer, which prevents leakage of a coolant from a coolant conduit formed either between adhesion faces of each pair of adjoining fuel cells or between adhesion faces of each fuel cell and each coolant conduit separator,

20 said fuel cell disassembly method comprising:

a coolant removal step of supplying a fluid to the coolant conduit in the course of disassembly of the fuel cells of the layered body to remove at least part of the coolant from a space between the adhesion faces of each pair of adjoining fuel cells
25 or from a space between the adhesion forces of each fuel cell and each coolant conduit separator.

14. (Amended) A fuel cell disassembly method in accordance with claim 13, said fuel cell disassembly method further comprising a fluid supplying step after said coolant removal step,

5 wherein an oxidizing gas conduit and a fuel gas conduit are formed in the layered body of the fuel cells,

 said fluid supplying step supplying a specific fluid to at least one of the oxidizing gas conduit and the fuel gas conduit formed in the layered body of the fuel cells to
10 facilitate disassembly of at least part of the fuel cells of the layered body, where the specific fluid is supplied to heighten an in-passage pressure of at least one of the oxidizing gas conduit and the fuel gas conduit for disassembly of the fuel cells of the layered body over a level of in-passage
15 pressure during power generation by the layered body of the fuel cells or otherwise the specific fluid has a function of lowering an adhesive force of the coolant sealing layer.

15. (Amended) A fuel cell that generates electric power through reaction of a fuel gas with an oxidizing gas, said fuel
20 cell comprising:

 an electrode assembly having an electrolyte interposed between a pair of electrodes;

 sealing layers located to surround periphery of the electrode assembly; and

25 a pair of separators arranged across the electrode assembly and bonded to the sealing layers, where one of the

separators facing one of the electrodes has a fuel gas conduit, while the other of the separators facing the other of the electrodes has an oxidizing gas conduit,

wherein at least either boundaries between the sealing
5 layers and the separators or boundaries between the sealing layers and the electrode assembly are made of a functional material having an adhesion force that is lowered by a fluid supply to at least one of the fuel gas conduit and the oxidizing gas conduit for disassembly of said fuel cell, which is
10 different from a fluid supply for power generation of said fuel cell.

16. A fuel cell in accordance with claim 15, wherein the functional material has a characteristic of lowering the adhesion force in a preset high temperature range.

15 17. A fuel cell in accordance with claim 15, wherein the functional material has a characteristic of lowering the adhesion force, when being exposed to hot water.

18. A fuel cell in accordance with claim 15, wherein the functional material has a characteristic of lowering the
20 adhesion force, when being exposed to either of an organic solvent or a release agent.

19. A fuel cell in accordance with claim 15, wherein the sealing layers are made of the functional material.

20. (Amended) A fuel cell that generates electric power
25 through reaction of a fuel gas with an oxidizing gas, said fuel cell comprising:

an electrode assembly having an electrolyte interposed between a pair of electrodes;

sealing layers located to surround periphery of the electrode assembly;

5 a pair of separators arranged across the electrode assembly and bonded to the sealing layers, where one of the separators facing one of the electrodes has a fuel gas conduit, while the other of the separators facing the other of the electrodes has an oxidizing gas conduit; and

10 a breaking guide that is formed in each of the separators to function as a starting point of breakage of the separator triggered by a fluid supply for disassembly of said fuel cell to supply a fluid to at least one of the fuel gas conduit and the oxidizing gas conduit to heighten an in-passage pressure of at least one of the oxidizing gas conduit and the fuel gas
15 conduit over a level of in-passage pressure level during power generation by the fuel cell.

21. A fuel cell in accordance with claim 20, wherein the breaking guide is formed in each of the separators to function
20 as a starting point of breakage of the separator triggered by the fluid supply for disassembly of said fuel cell, which is different from a fluid supply for power generation of said fuel cell, to supply a fluid to at least one of the fuel gas conduit and the oxidizing gas conduit.

25 22. A fuel cell in accordance with claim 20, wherein the fluid supply for disassembly of the fuel cell supplies either

water or an organic solvent.